

Electrolysation of Muriatic Acid

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sulphur from sulphuric acid as the result of the action of the nascent hydrogen. In 1804,, Hisinger and Berzelius stated that it was the direct result of the action of the voltaic pile/ an opinion which from that time Davy seems to have adopted, and which has since been commonly received by all. The change of my own opinion requires that I should correct what I have already said of the decomposition of sulphuric acid in a former part of these Researches (288): I do not now think that the appearance of the sulphur at the negative electrode is an immediate consequence of electrolytic action.

493. *Muriatic acid*.—A strong solution gave hydrogen at the negative electrode,, and chlorine only at the positive electrode; of the latter, a part acted on the platina and a part was dissolved. A minute bubble of gas remained; it was not oxygen, but probably air previously held in solution.

494. It was an important matter to determine whether the chlorine was a primary result, or only a secondary product, due to the action of the oxygen evolved from water at the *anode* upon the muriatic acid; *i.e.* whether the muriatic acid was electrolysable, and if so, whether the decomposition was *definite*.

495. The muriatic acid was gradually diluted. One part, with six of water gave only chlorine at the *anode*. One part with eight of water gave only chlorine; with nine of water, a little oxygen appeared with the chlorine: but the occurrence or non-occurrence of oxygen at these strengths depended, in part, on the strength of the voltaic battery used. With fifteen parts, of water, a little oxygen, with much chlorine, was evolved at the *anode*. As the solution was now becoming a bad conductor of electricity, sulphuric acid was added to it: this caused more ready decomposition, but did not sensibly alter the proportion of chlorine and oxygen.

496. The muriatic acid was now diluted with 100 times its volume of dilute sulphuric acid. It still gave a large proportion of chlorine at the *anode*, mingled with oxygen; and the result was the same, whether a voltaic battery of forty pairs of plates or one containing only five pairs were used. With acid

of this strength, the oxygen evolved at the *anode* was to the hydrogen at the *cathode*, in volume, as seventeen is to sixty-four; and therefore the chlorine would have been thirty volumes, had it not been dissolved by the fluid.

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. 280, 281.

**Annales de Chimie*, 1804, torn. li. p. 173.